

CLAIMS

What is claimed is:

1. A vessel comprising:
a water purification system comprising:
a water intake system comprising a water intake and a water intake pump,
wherein the water intake is operable to be disposed above a thermocline
region within a body of water;
a reverse osmosis system;
a concentrate discharge system comprising a plurality of concentrate
discharge ports;
a permeate transfer system;
a power source; and
a control system,
wherein
the reverse osmosis system is in communication with the water intake
system,
the concentrate discharge system and the permeate transfer system are
in communication with the reverse osmosis system,
the power source is in communication with the water intake system,
the reverse osmosis system, and the permeate transfer system, and
the control system is in communication with the water intake system,
the reverse osmosis system, the concentrate discharge system, the
permeate transfer system, and the power source; and
wherein
the concentrate discharge system comprises a member operable to
extend from the vessel within or below the thermocline region.
2. The vessel of claim 1, wherein the concentrate discharge system further comprises
an aspirator suitable for drawing water into the discharge member from the
surrounding body of water for mixing and subsequent dilution of the concentrate
before the concentrate is discharged through a plurality of discharge ports.

3. The vessel of claim 1, wherein the water intake comprises a sea chest.

4. A vessel comprising:
 - a water purification system comprising:
 - a water intake system comprising a water intake and a water intake pump;
 - a reverse osmosis system;
 - a concentrate discharge system comprising a plurality of concentrate discharge ports, wherein the concentrate discharge ports are operable to discharge concentrate above a thermocline region of a surrounding body of water;
 - a permeate transfer system comprising a transfer pump;
 - a power source; and
 - a control system,
 wherein
 - the reverse osmosis system is in communication with the water intake system,
 - the concentrate discharge system and the permeate transfer system are in communication with the reverse osmosis system,
 - the power source is in communication with the water intake system, the reverse osmosis system, and the permeate transfer system, and
 - the control system is in communication with the water intake system, the reverse osmosis system, the concentrate discharge system, the permeate transfer system, and the power source; and
 wherein
 - the water intake system comprises a member operable to extend from the vessel into or below the thermocline region.

5. The vessel of claim 4, wherein the concentrate discharge system further comprises an aspirator suitable for drawing water into the discharge member from the

surrounding body of water for mixing and subsequent dilution of the concentrate before the concentrate is discharged through a plurality of discharge ports.

6. A vessel comprising:
 - a water purification system comprising
 - a water intake system comprising a water intake and a water intake pump;
 - a reverse osmosis system;
 - a concentrate discharge system comprising a plurality of concentrate discharge ports;
 - a permeate transfer system;
 - a power source; and
 - a control system,
 wherein
 - the reverse osmosis system is in communication with the water intake system,
 - the concentrate discharge system and the permeate transfer system are in communication with the reverse osmosis system,
 - the power source is in communication with the water intake system, the reverse osmosis system, and the permeate transfer system, and
 - the control system is in communication with the water intake system, the reverse osmosis system, the concentrate discharge system, the permeate transfer system, and the power source; and
 wherein
 - the water intake system is operable to intake water into the water purification system at a depth that reduces intake of plankton into the water purification system.
7. A method for producing a permeate on a floating structure comprising:
 - intaking water through a water intake system comprising a water intake, wherein
 - the water intake is disposed above a thermocline region of a body of water surrounding a floating structure;

supplying the water to a water purification system;
filtering the water to produce a permeate and a concentrate;
discharging the concentrate into the surrounding body of water through a
concentrate discharge system comprising a discharge member comprising
a plurality of concentrate discharge ports, wherein the plurality of
concentrate discharge ports is disposed within or below the thermocline
region.

8. The method of claim 7 further comprising the step of drawing water into the discharge member from the surrounding body of water as the concentrate passes through the discharge member.
9. A method for producing a permeate on a floating structure comprising:
intaking water through a water intake system comprising a water intake member
extending from the hull of the floating structure, wherein the water intake
member comprises a water intake disposed above a thermocline region in
a body of water surrounding a floating structure;
supplying the water to a water purification system;
filtering the water to produce a permeate and a concentrate;
discharging the concentrate into the surrounding body of water through a
concentrate discharge system comprising a discharge member comprising
a plurality of concentrate discharge ports, wherein the plurality of
concentrate discharge ports is disposed within or below the thermocline
region.
10. The method of claim 9 further comprising the step of drawing water into the discharge member from the surrounding body of water as the concentrate passes through the discharge member.
11. A method for producing a permeate on a floating structure comprising:

intaking water through a water intake system comprising a water intake member extending from the hull of the floating structure, wherein the water intake member comprises a water intake disposed within or below a thermocline region in a body of water surrounding a floating structure;
supplying the water to a water purification system;
filtering the water to produce a permeate and a concentrate;
discharging the concentrate into the surrounding body of water through a concentrate discharge system comprising a plurality of concentrate discharge ports, wherein the plurality of concentrate discharge ports is disposed above the thermocline region.

12. The method of claim 11, wherein the concentrate discharge system comprises a discharge member comprising a plurality of concentrate discharge ports.
13. The method of claim 12, further comprising the step of drawing water into the discharge member from the surrounding body of water as the concentrate passes through the discharge member.
14. A method for producing a permeate on a floating structure comprising:
intaking water through a water intake system comprising a water intake, wherein the water intake is disposed at a depth below 10 meters;
supplying the water to a water purification system;
filtering the water to produce a permeate and a concentrate;
discharging the concentrate into the surrounding body of water through a concentrate discharge system comprising a plurality of concentrate discharge ports.